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When did Disruption Become a Good Thing?

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When did Disruption Become a Good Thing?

Emerging Business Models in the Construction Industry

May 2016
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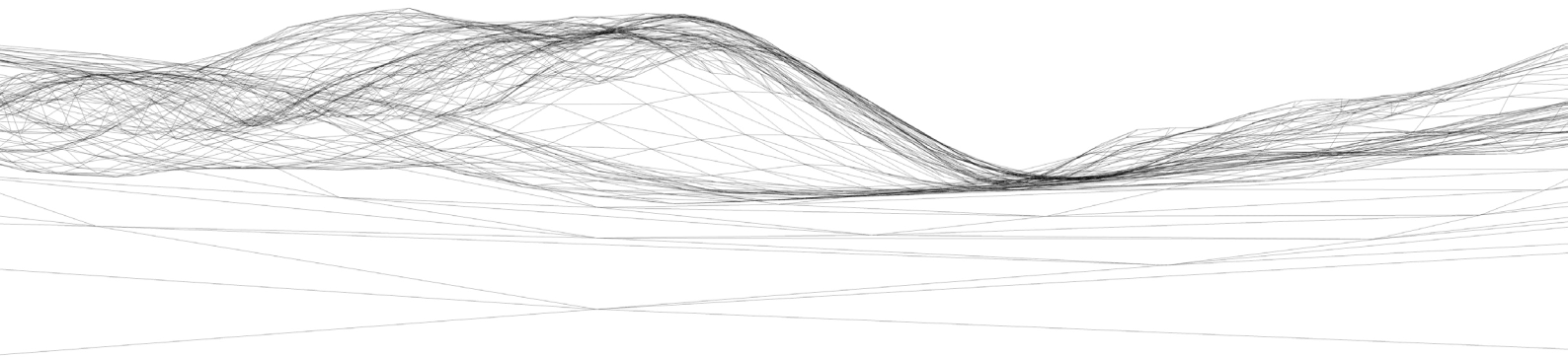

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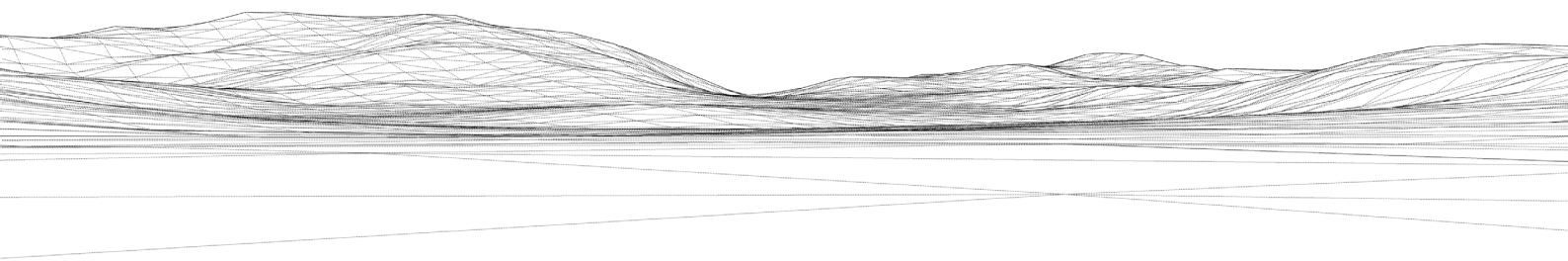

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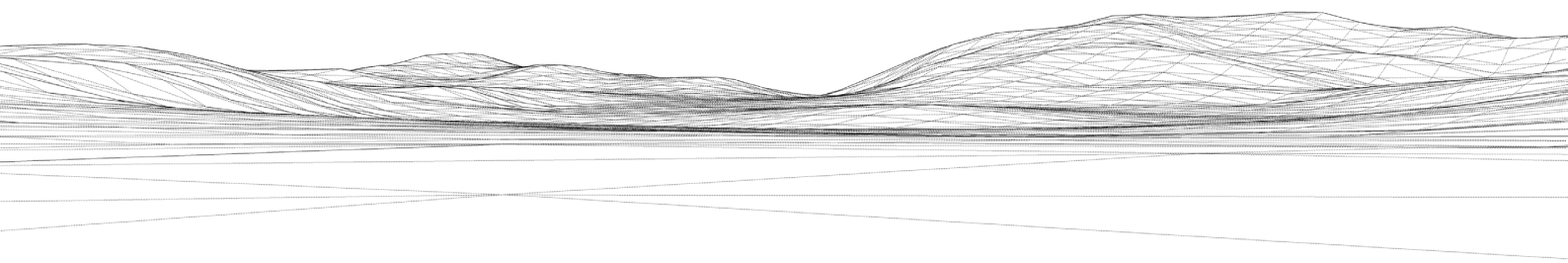


Executive Summary

This research project emerged from a BRANZ workshop in 2015 – *Beyond The Seen.* Our research sought to identify new and emerging business models in the construction industry, with a focus on the residential sector. It also sought to identify why new business models are slow in coming to the construction sector, and what are the barriers to disruptive innovation.

We have identified several unintended consequences of the current approach to managing risk in the sector (from banking to building) which stifle innovation and incentivise the building of poorer quality homes, and poorer quality renovations. The research identifies a number of shorter and longer term projects which would contribute to making it easier to dramatically raise the standard of New Zealand's building stock, and improve innovation across the construction industry.

Mostly, the barriers have occurred as unintended consequences of regulation, and attempts to reduce risk to the industry. Ironically, the desire to remove risk has led to a slowing in improvement of quality, by reducing innovation.

Innovative business models are coming, albeit slowly and in small pockets. BRANZ has an important role as a catalyst, encouraging others in the construction sector to think differently. Innovation will come, whether or not the industry is ready for it. With strategy, research, agility, and appropriate business models, New Zealand can meet the challenges of disruptive innovation with confidence.

Purpose of this report—to prepare for disruption

The purpose of this report is to identify the disruptive trends and opportunities facing New Zealand's construction industry, so that it can prepare for the future with confidence and resilience. New Zealand needs the construction industry to build high quality, sustainable buildings to house and sustain people and businesses reducing social costs. To do that, the industry needs to be open and agile—able to predict and quickly respond to change. This report is a first step in that process. It:

1. identifies innovators and disruptors in New Zealand, and captures information from interviews with them to learn what they are doing differently
2. identifies the international disruptors and innovators in construction, to see what inspiration and lessons we can apply here
3. Considers the barriers in New Zealand to disruptive innovation
4. discusses the next steps towards the construction industry becoming more flexible, agile, and future-focused, including the consideration of new business models.

Background—why this report was commissioned

In October 2015, BRANZ brought together thought leaders from all over New Zealand to explore how the construction industry could explore future trends and opportunities. Several key questions arose from the workshop.

- How does disruption apply to the New Zealand building industry?
- Who are the disruptors in the industry?
- What are they doing differently?
- What is emerging, and how can the industry best prepare for future trends?
- What are the barriers to innovative disruption?

BRANZ commissioned this report to increase understanding of disruptive business models, and the role innovation will play in a resilient and agile building industry into the future.

The majority of New Zealand housing stock is of poor-quality compared to other countries. New Zealanders do not understand this. As a whole, New Zealanders are not educated about housing quality. Our national focus on the lowest cost of construction rather than the lifetime cost of ownership of a house has led to high post-occupancy costs, and too many houses that are not healthy, warm, or dry. Good quality housing is vital for the health and well-being of New Zealanders. Low-quality housing becomes a cost to the environment and the country's economic and human resources.[1]

New Zealand's population is increasing. The way we currently build homes is not sustainable—we can't meet the demand with our current construction models and techniques. The way we live is not sustainable. We need to new ways of living, not just new ways of constructing homes.

What is disruption, and why does it matter?

'Business model innovation is a wonderful thing. At its simplest, it demands neither new technologies nor the creation of brand new *markets: it's about delivering existing products that are produced by* existing technologies to existing markets. And because it often involves changes invisible to the outside world, it can bring advantages that are*hard to copy.'* [2]

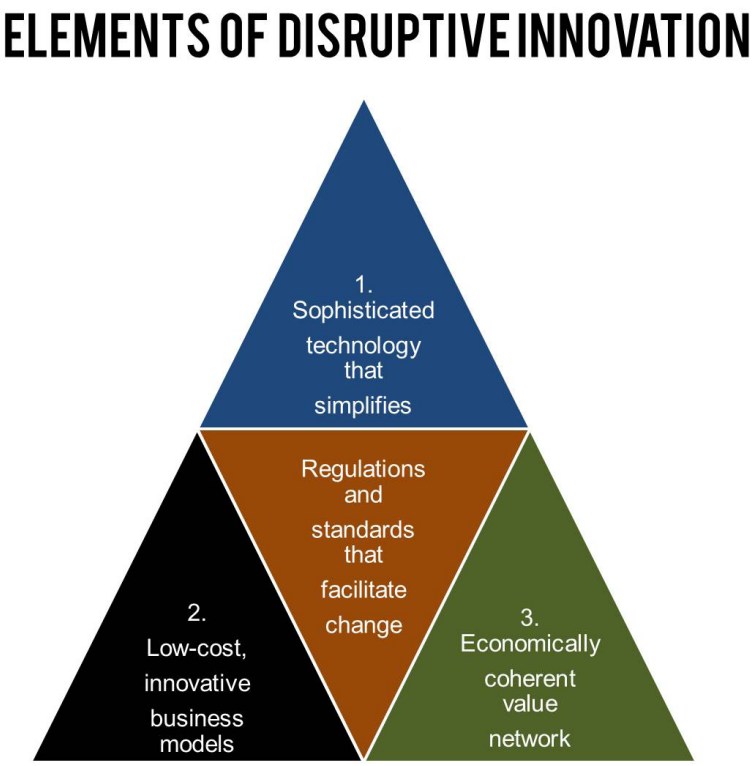
One definition of disruption is something that breaks the existing model. Existing processes tend to work and keep everyone happy until all of a sudden they don't work any more.

[1] "Perceptions of Housing Quality in 2014/15." *Statistics New Zealand,* 10 2015. http://stats.govt.nz/browse_for_stats/people_and_communities/housing/perceptions-housing-quality-2014-15.aspx.

[2] Girotra, Karan, and Serguei Netessine. "Four Paths to Business Model Innovation." Harvard Business Review, July 1, 2014. https://hbr.org/2014/07/four-paths-to-business-model-innovation.

The four key elements of disruptive innovation according to Clayton Christensen[3] (who coined the term) are:

1. Sophisticated technology that simplifies.
2. Low-cost, innovative business models
3. A value network that is economically coherent
4. Regulations and standards that facilitate change.



In many other industries, disruption has had a major impact. Examples include AirBnB, SalesForce , Xero, even Uber. But in the construction industry, disruption has occurred in small isolated pockets that do not tend to change the sector as a whole. Examples of this are:

- computerised machines replacing skilled labour (such as computer numerical controlled CNC Machines)
- cloud-based platforms that offer specification as a service. ProductSpec and SmartSpec operates this way. Architiser source (a US company) sums up why ProductSpec and SmartSpec matter:

'Today, specifying is a nightmare of Google searching, phone calls with salespeople, lunch-and-learns, PDFs, and postage stamps. You know things are pretty f**ked up when stamps are involved! Everything we do springs from the basic observation that architects are powerful; we just need to unlock their value.'[4]

- PlanGrid[5] offer an app which allows cloud storage of blueprints, which enables better collaboration and easier workflows is another example of this type of business.

These disruptions replace traditional processes with digital ones, which speeds things up, but doesn't really change the industry as a whole. The New Zealand construction sector has yet to embrace true disruption.

[3] "Disruptive Innovation." *Clayton Christensen*, July 10, 2012. http://www.claytonchristensen.com/key-concepts/.

[4] "Revolutionary Tools for the Architecture Industry: Marc Kushner on Architizer | Archipreneur." Accessed May 4, 2016. http://www.archipreneur.com/revolutionary-tools-for-the-architecture-industry-marc-kushner-on-architizer/.

[5] "PlanGrid — the Construction App That Works for You." Accessed May 4, 2016. https://www.plangrid.com/en.

Scope of this report—a focus on residential construction and business models

This report focuses largely on residential construction in New Zealand due to its impact on social and environmental resources. However, many of the lessons provided here will also be applicable to the commercial building sector. This report is not about innovative technology or materials. While they are important, they are outside the scope of this research.
As researchers, we initially focused only on construction. But as we delved more deeply, we realised that we would need to broaden our approach to every field that impacts on building, including:

- consumer/homeowner
- financing
- architecture and design
- specifying
- planning
- building.

We also focus on understanding the role of business models rather than on technology. It is true to say that innovations in construction over the last century have come largely from developing and applying new technologies (such as the introduction of pre-nail technology in New Zealand, Pink Batts, or Gib board). In general, changes to business models in construction have received less attention from researchers.

Finding business models that will allow the construction industry to innovate, build, and grow in a fast-changing world is essential. Finding business models that work matters to the construction sector. It is also vital to New Zealand as a whole, as we strive to house our people in an appropriate, healthy, and sustainable way.
Business models in the construction sector have not been well researched in New Zealand until now. But we are not alone.

Internationally there are a number of firms currently held up as Innovators. Several International architecture firms are named as being highly creative (eg ShoP, SANAA[6], BIG), but they are not named for being disruptive to the ***business*** of architecture.

The role of business models in assisting innovation in the construction sector has not received much attention and research effort internationally. There has not be many other documented study into Construction Business Models, globally. It is high time that changed.

[6] SANAA is the only firm in the sector named by Wired Magazine amongst its top 50 innovators of 2015 http://www.fastcompany.com/most-innovative-companies/

Our Method

We started by asking people in the New Zealand construction industry who they see as the biggest disruptors. Who do they think will really change the game? Identifying people in New Zealand who are introducing and applying a disruptive business model was difficult. Not because we lack innovators—we have plenty of those. But we were looking for those who, to quote the Karan Girotra and Serguei Netessine study, are 'delivering existing products that are produced by existing technologies to existing markets'. We wanted to talk to businesses that are defining value differently, or differentiating their products by the way they are sold, or charged for.

We undertook extensive interviews with 8 companies/people (see Appendix 1 for the full list) and had wider conversations with other people in the sector. We have identified additional people who would be interested in further research but were unavailable at this time. The transcripts of our interviews are located in Appendix 3. We conducted a literature search, focussing on business model innovation in the construction sector and found that very little had been written on the topic. We also scanned international articles on disruption, finding little content regarding the sector.

We also identified international disruptors in the sector and refer to them throughout this report. These are companies and organisations whose business models are different to those of their peers in the industry. They range from Territorial Authority/ Council planning processes to fabrication of buildings.

Business models

The simplest way to describe a business model is as how a business plans to make money. What products and services are your customers willing to buy? How will they pay for it?

At a more detailed level, a business model contains 9 important building blocks[7].

1. Customer segment. Who are your customers?
2. Value proposition. What sets you apart from your competition?
3. Reaching your customers. What channels can you most effectively use?
4. Customer Service. How do you attract and retain our customers?
5. Revenue streams. What can you charge for?
6. Key resources. What resources do you have and use?
7. Key activities. What do you really do?
8. Key partners. Who do you work with to deliver or distribute your product or service?
9. Cost structure. How do you make money?

Business models are not about technology, tectonics, or structures. They are about creating better value for customers, leading to greater success and profit for the business.

While there is a growing body of literature about business model innovation, there is very little that is specifically about business models in the construction sector. It seems that given that innovation in this sector occurs through either design (such as via creative architecture) or the development of new technologies (such as Building Information Modeling, BIM).

[7] "Strategyzer | Business Model Canvas." Accessed May 4, 2016. http://www.businessmodelgeneration.com/canvas/bmc.

‘Despite the burgeoning literature of business models in the business and management field, such a body of knowledge in building and construction seems to be far underdeveloped.’[8]

An example of thinking differently

To create businesses models that work for the New Zealand construction industry, we need to go back and ask basic questions, rather than assuming that we already know the answers.

SolarCity, which describes itself as New Zealand’s number one solar provider, has a business model different to others in the market. Its example leads us to wonder about other products in or on houses that could be serviced, upgraded and serviced rather than owned. Rooves, windows, and heating, for example. Let’s imagine that a homeowner needs to buy a roof. Why are they buying a roof? To provide an impermeable covering for their home, one that will be dependable, maintained, and ‘always on.’ But there could be many different ways of providing what the homeowner needs. The current business model would involve purchasing, painting, maintaining, patching, or replacing the roof.

An alternative model might be a subscription service, where the homeowner pays a monthly fee for ‘roof performance’ over a 15-year period. All costs of maintaining the roof for that 15-year period are included. For the roofing company, this markedly changes their cash flow, from lumps of sales to a monthly or annual income that grows over time. For the consumer, the roof moves from being a capital item, or product, to an expense, or service.

Innovation in New Zealand largely at product level

In this country, innovation in the construction industry has tended to be at the product level, rather than by changing methods of funding and costing. We are not alone in this—the construction industry internationally is limited in the same way. The construction sector is constantly changing, and so are all of the fields within it. Innovations and new technologies that are rapidly changing the sector include:

- new materials and building techniques
- 3D printing
- robots
- smarter tools[9]
- prefab and modular housing
- structural Insulated Panels (SIPS).
- Cross Laminated Timber (CLT), and various other new forms of laminated timbers that allow for fast builds with high strength, insulation and integrity.

In many ways, these meet the first requirement of Clayton Christiansen’s typology – ‘Sophisticated technology that simplifies’. But despite these innovations and new technologies, the New Zealand construction sector appears to be characterised by:

- aiming for the cheapest price, with increasing costs and prices
- aiming for the minimum or below code compliance
- being fragmented as an industry and collaborating poorly
- working at a suboptimal level, including quality problems investing little in research, development and innovation (R&D&I), so working in a low-tech way

[8] Pan, Wei, and Chris Goodier. “House-Building Business Models and Off-Site Construction Take-Up.” *Journal of Architectural Engineering* 18, no. 2 (2012): 84–93. doi:10.1061/(ASCE)AE.1943-5568.0000058.

[9] Wanda Lau. “The Tech to Expect in Architecture in 2016.” Architect, January 14, 2016. http://www.architectmagazine.com/technology/the-tech-to-expect-in-architecture-in-2016_o.

- continuing to use paper-based systems
- suffering from poor productivity
- being risk adverse
- working in boom or bust cycles.

What we can learn from Finland

The Finnish Construction Industry has released a number of useful reports into business models in the construction sector. Their 2013 Building Information Management Study found that the Finnish construction industry lacks solid business models, and does not really understand what business models are.

'Managers in construction…had significant problems describing their companies' business models and value creation logic, pointing out the lack of analysis and understanding of customer values and needs in the project delivery process.' The researchers concluded that this probably led to persistent client disatisfaction in the construction industry.'

Finnish construction businesses suffer from the same limited understanding of value for customers as limits their New Zealand counterparts. 'Indeed, the conventional business models neglect the customer perspective and this revolve around internal efficiency rather than customer value creation', the Finnish researchers[10] found.

Common business models in the industry now

The following are the common business models used in the construction industry.

- Builders offering a service (not fixed price)
- Architects working for a percentage of the total build cost, plus time and materials. This provides an incentive to create more expensive buildings.
- Developers sell either land, or land plus house.
- Component-makers sell their products.
- Architects and builders as developers—a new and growing trend.
- Self-Builders[11] - people who buy their own land and build on it

[10] Aki Pekuri, Laura Pekuri. "The Role of Business Models in Finnish Construction Companies." Australasian Journal of Construction Economics and Building 13, no. 3 (2013): 13–23. doi:10.5130/ajceb.v13i3.3402.

[11] This is particularly identified in the UK. The other models have also been identified in the only study we could find of UK Models - Pan, Wei, and Chris Goodier. "House-Building Business Models and Off-Site Construction Take-Up." *Journal of Architectural Engineering* 18, no. 2 (2012): 84–93. doi:10.1061/(ASCE)AE.1943-5568.0000058.

Emerging business models – the big trends

There appear to be seven new business models we see emerging globally in the sector. They are not mutually exclusive.

1. Mass Customisation
2. Products Becoming Services
3. Services Becoming Products
4. Separation of Ownership and Use
5. The Sharing Economy
6. Agile Design & Construction
7. Agile Planning

1. Mass customisation

This will lead to more manufacturing than building. New technologies mean that it is possible to combine 'mass' and 'bespoke' methods of production. This major trend will have huge impact on the construction industry, allowing for customised modular housing.

The trend is already common in commodity fashion. For example, both NikeID and Vans Shoes allow people to customise their own shoe design, order them online and have them delivered.

Similar innovations are coming in the construction industry. Apps and modular housing will allow homeowners to design their own homes and have them delivered, but with the ability for customers to choose their own flexible modules. That allows for a mass market product to be customised. For example, every double-glazed window in a new house will have a standard size and shape. At the modules will save money, and ultimately make new builds a lot cheaper.

A number of firms are working towards this. It requires enormous computing power, and until recently, the automation of plans was not possible.

- Makers of Architecture (MOA)[12] is an innovative Wellington company that uses the latest technology to provide flexible, customised prefabricated buildings—what they call 'mass customisation'. They specialise in digital fabrication through their sister company Makers Fabrication[13] and assembly, and do everything from design to manufacture. Their business model is new and different, challenging existing models. MOA's business goals are:
    - using high-tech design to build efficiently
    - allowing a wider demographic to build, because costs are reduced
    - producing flexible buildings that are mass produced but able to be customised
    - helping people into buildings that contribute towards a happy, sustainable and ethical lifestyle.

'We're writing our own script', says partner Beth Cameron. 'We're about customisation from an architectural perspective, not a building perspective.' MOA sees machine 'deep learning' and Artificial intelligence (AI) as the coming trend, and plans to embrace it.

[12] "Makers of Architecture." *Makers of Architecture*. Accessed May 4, 2016. http://www.makersofarchitecture.co.nz/.

[13] "Makers Fabrication." *Makers Fabrication Ltd.* Accessed May 4, 2016. http://makersfabrication.co.nz/.

Other housing companies using innovative customisation

- Blu Houses[14], this US firm allows customers to 'design' the house they want via an app. It will then be fabricated, delivered to the site, and assembled there. It has some major limitations, but it is a view of an almost certain future for other firms. Their standard houses are also able to be customised through the combining of predetermined modules.[15]
- MIMA allows a very simple range of customisation to occur through a google app[16]. The design is sent back to MIMA for costing, and then fabrication and delivery.
- Concision[17] built homes are all designed as "one-off" variations. This allows for customers to adapt the homes to the style they want, and adjust the windows etc to the site.
- Keith Hay homes[18] were a pioneer in this area in NZ.

2. Products become services

One of the ways some businesses are differentiating their product is by turning goods into services. In future, customers may be able to rent their carpet, their roof, or their whole house, for an amount that includes on-going maintenance for a fixed period. People will no longer need to own everything. Leasing may lead to more frequent upgrades and better maintenance—both strong benefits for customers.

- Architiser Source[19] is in beta, but plans to combine service and product. Here's what they say about themselves:

  > 'Source is specifying made simple. Finding products for architecture projects is a herculean task. First you need to know what you are looking for - then you need to find the people who make it. There has never been a good tool for this, until now…With Source, architects anonymously post the product they are looking for and we send that request to relevant manufacturers. They have 7 days to respond with pricing, lead time and product specs, allowing you to make an informed decision based on multiple competitive bids, without all of the leg work.'

- SmartSpec[20] – takes the books and library products that specifiers use and creates an online subscription service which replaces rooms of books. Instead of owning a library, specifiers access the catalogues they need online.
- Common[21] is a US company which provides housing. They say: 'Our members live in beautifully curated spaces with a wide range of amenities such as free onsite laundry, Wi-Fi, a private garden, and much more. All included in a flat, monthly fee.' What makes Common different is that they work directly with developers, and have turned space into a service via a technology platform. This is not your usual online rental company, or even a serviced apartment company. They solve a problem for people wanting to live somewhere great, and for developers wanting to maximise their real estate income.
- Roam[22] is another US company with a home rental idea designed for 'digital nomads'. 'Just managing my stuff and going back and forth between Airbnbs and housesitting became more cumbersome over time,' Haid (the founder of Roam) says. 'At the same time, I was involved in a couple of early co-living communities in San Francisco, and saw the

[14] Robinson, Melia, 2016 Apr. 13, 296 13, and 4. "You Can Now Design a $250,000 Tiny House on an App and Get It Delivered in Months." Tech Insider. Accessed May 4, 2016. http://www.techinsider.io/blu-homes-prefab-tiny-houses-2016-4.

[15] "Make It Yours | Blu Homes." Accessed May 4, 2016. https://www.bluhomes.com/customize-your-home.

[16] https://9e7418e0099f085c99ce67e93245ac8e429a830f.googledrive.com/host/0B6bwFvHpPfbEaVp4UGRucWtXQWs/MIMAHousing.html

[17] "Concision." Accessed May 5, 2016. http://concision.co.nz/.

[18] "Keith Hay Homes." Accessed May 4, 2016. https://www.keithhayhomes.co.nz/.

[19] "Architizer Source: Firms." Accessed May 5, 2016. http://support.architizer.com/customer/en/portal/topics/831475-architizer-source-firms/articles.

[20] "Specification Writing System for Building and Construction Projects." Accessed May 7, 2016. https://smartspec.co.nz/.

[21] "Common - A Friendly Home." Accessed May 5, 2016. http://www.hicommon.com/

[22] Peters, Adele. "Instead Of Renting An Apartment, Sign A Lease That Lets You Live Around The World." ***Co.Exist***, May 3, 2016. http://www.fastcoexist.com/3059469/instead-of-renting-an-apartment-sign-a-lease-that-lets-you-live-around-the-world.

cultural value of something like that.' A monthly fee allows members to live in any of the locations around the world, including Madrid and Bali.

SolarCity.
Solar Power for residential homes has always been a product. Homeowners bought panes and installed them. They owned the panels, and the power produced by them. What if, instead of being a product, solar was a service? That's the model SolarCity offers. Instead of owning solar panels, SolarZero rents them to you. It assesses clients' energy needs, then installs an appropriate system—and monitors it constantly. Clients are kept informed, and the technology is updated by SolarCity as it becomes available.

3. Services become Products

A number of architects are moving away from a services model to a product model. Architects are working with builders to license their designs. More and more architects are designing modular housing, which can be built for a fixed price. Sometimes, the architects is also involved in the building, or in the factory. Architects who become developers are known as archipreneurs.
Examples of this services to product trend include:

- Daniel Liebskind[23] has designed and fabricated a four bedroom, two-floor home which can be shipped to almost any location in the world. It is created within months, and assembled by a team of experts within weeks. A limited edition of 30 have been created. Made of wood from renewable sources, zinc, and aluminum, the 5,000 square foot, German-made structure meets the highest standards of design and craftsmanship and complies with the highest energy-saving standards in the world.
- Phillippe Starck[24] has collaborated with a Slovenian construction company to make ecological Prefab housing.
- Vipp.com "Shelter"[25] has designers constructing every aspect of the house (including all funishings, contents, hooks, ladder, kitchen, daybed, lamps, shelves, towels, toilet brush…and so on). 'Living in the Product' is their motto.
- Mike Greer Homes in Christchurch is involved in the Concision factory. Houses are factory-built to a fixed price, often with a land and home package. This is a major change from on-site construction techniques and associated pricing. All the Concision-fabricated homes are built to a fixed price.
- Box[26] is a New Zealand-based architectural firm that moved into the delivery of fixed price, modular designed eco housing.

4. Ownership and use are separated

Customers are offered different options for building materials. They can buy outright, or lease them. We expect to see massive growth in this business model in the near future.

- SolarCity - As discussed elsewhere, SolarCity offers a number of business models. One of these is Solar Zero, where the panels are installed on the roof and "We pay for the panels and you buy the power

[23] Daniel Libeskind's Prefab Villa. Accessed May 5, 2016. https://www.youtube.com/watch?v=Hw-6qWv3sZU. and "The Villa - Libeskind Signature Series." Libeskind. Accessed May 5, 2016. http://libeskind.com/work/the-villa-libeskind-signature-series/.

[24] "Starck with Riko." Accessed May 6, 2016. http://www.starckwithriko.com/.

[25] "Vipp Shelter." Vipp. Accessed May 5, 2016. https://www.vipp.com/shelter/the-vipp-shelter/the-vipp-shelter/.

[26] "Box™." Accessed May 4, 2016. http://www.boxliving.co.nz/.

they generate, as part of our energy service. You'll pay a low monthly fee that's locked in for the next 20 years which could save you thousands of dollars over the lifetime of the agreement."[27] This model is very different to the usual one of the homeowner buying the panels and having them installed.

- HireThings[28] is a NZ company which enables neighbours to rent each others' Tools and Equipment. This is part of a global movement in the "peer to peer" economy (including lending as well as accommodation and fashion).

5. The sharing economy

This trend already affects workspaces, where many workers no longer have their own dedicated space. Cars, too, are increasingly becoming shared, with schemes where people can rent or borrow one for a short period as needed. The same model is likely to affect housing. Co-housing, with friends or communities building housing to suit their lifestyles, is likely to become more common.

'Space as a Service' is a new idea that has been commercialised globally (in New Zealand by BizDojo[29] and Colab[30], for example).

- Wework[31] and their newly launched WeLive are part of this trend. Archipreneur explains -

'Founded in 2010, WeWork has become the forerunner of the space as a service trend and is one of the fastest growing consumers of office space in New York City. Recognizing the disappearance of 9-to-5 jobs, its founders decided to create a service that would function like a "physical social network"'.

Essentially, WeWork transformed a real estate business into a technology platform. The idea of sharing space isn't new, but WeWork has translated space sharing into a concept closely connected to the lifestyle and work habits of younger generations.

WeWork leases space wholesale from landlords and then sublets it, at a margin, in small blocks of floorspace. The company currently manages over 3 million square feet of space. They offer pay-as-you-go access, or 'unlimited commons' membership that allows people to use WeWork locations anywhere in the world. They provide tenants with the Internet, printing services, and beverages, as well as places to relax and take a break from working. The company takes care of everything in terms of actual office management, from utility bills to replenishing the ink in the printer."[32]

WeWork has created a Research and Development team [33] which focuses on "Spatial Analytics" - the way people actually use the space they have (eg how many people usually meet in a 12 person meeting room?). They are using the data from building use, in order to design buildings which can be used the way the user wants.[34]

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[27] "Which Solar Is Best? » SolarCity." Accessed May 5, 2016. http://www.SolarCity.co.nz/residential/which-solar-is-best/.

[28] "Hire Things." Accessed May 5, 2016. http://www.hirethings.co.nz/.

[29] "BizDojo." BizDojo. Accessed May 7, 2016. http://www.bizdojo.com/.

[30] "ColabNZ." COLAB NZ. Accessed May 7, 2016. http://colabnz.com/.

[31] Grozdanic, Lidija. "Space as a Service: Business Models That Change How We Live and Work." Accessed May 5, 2016. http://www.archipreneur.com/space-as-a-service-business-models-that-change-how-we-live-and-work/.

[32] Grozdanic, Lidija. "Space as a Service: Business Models That Change How We Live and Work." Accessed May 4, 2016. http://www.archipreneur.com/space-as-a-service-business-models-that-change-how-we-live-and-work/.

[33] Davis, Daniel. "Spatial Analytics: New Ways of Understanding Architecture at WeWork R&D." WeWork, March 17, 2016. https://www.wework.com/blog/posts/spatial-analytics.html.

[34] Daniel Davis (wework) Keynote Design Modelling Symposium 2015. Accessed May 5, 2016. https://vimeo.com/148073399.

- AirBNB[35] has been widely touted as the world's largest hotel chain which owns no beds[36]. It has changed the financial dynamics for renters - enabling people to rent better space than they usually could afford as they can charge a premium for short term "flatmates". A new industry has set up around AirBnB - providing services to people who rent out their spare rooms (see Pillow[37] in New York, and AirSorted[38] in London and Edinburgh as examples).

6. Agile design & construction

Agile methodologies take inspiration from Agile software development. They involve new values, principles, practices, and benefits and are a radical alternative to command-and-control-style project management. Agile methodologies are spreading across a broad range of industries and functions. They are used in many different ways by major US companies. National Public Radio employs agile methods to create new programming. John Deere uses them to develop new machines, and Saab to produce new fighter jets. Intronis, a leader in cloud backup services, uses them in marketing. C.H. Robinson, a global third-party logistics provider, applies them in human resources. Mission Bell Winery uses them for everything from wine production to warehousing to running its senior leadership group.[39]

- MIMA Architects[40] in Portugal combine prefabrication with Agility. Here's what they say about themselves. 'MIMA House is unique for its ability to be reconfigured by the owners in project and also post-delivery. The interior walls consist of lightweight panels that can be easily relocated or removed by two people. Several years have been spent refining the concept in order to arrive at a finished product that would be quick to manufacture, easy to assemble, of good quality and affordable.' The house can also be bought with or without interior walls. 'You can choose between an open space or an equipped house. If you decide for an equipped house, MIMA House includes interior walls, doors, downlights, wardrobe, bathroom, boiler and kitchen. The price varies depending on the type, components and finishes of MIMA House you choose. You may also adjust the final price to your own budget.'
- Cheshire Architects,[41] NZ are a Architecture practice which has moved into the spaces often held by other disciplines within design practice - eg web and furniture design. They have developed a methodology for developing a "one-day" workshop of all the stakeholders in a project and throughout the day build the MasterPlan Book - which is complete at the end of the workshop. This is a form of Agile Planning and Design, rather than completing a prototype in the first "sprint", agreement is reached between all parties regarding the vision of the project and its core elements determined. Other Architects may do this, but usually it is done stakeholder by stakeholder, and over a longer period of time. What makes this interesting is its speed, and collaborative approach. It also supports their business model - making a virtue of their highly bespoke approach. The methodology is re-used, but every design is new.

The agile approach could apply to construction by allowing for the minimum to be built immediately, and for the rest of the house to be built as and when needed. Nick Williamson explains that this is how it works on the TV show ***The Block,*** but not in

[35] "Vacation Rentals, Homes, Apartments & Rooms for Rent." Airbnb. Accessed May 5, 2016. https://www.airbnb.com/.

[36] McRae, Hamish. "Facebook, Airbnb, Uber, and the Unstoppable Rise of the Content Non-Generators." The Independent, May 5, 2015. http://www.independent.co.uk/news/business/comment/hamish-mcrae/facebook-airbnb-uber-and-the-unstoppable-rise-of-the-content-non-generators-10227207.html.

[37] "Pillow - Short-Term Rental Management." Pillow. Accessed May 5, 2016. https://www.pillowhomes.com.

[38] "Airsorted Airbnb Management." Airsorted- Airbnb Management. Accessed May 5, 2016. http://www.airsorted.uk/.

[39] Rigby, Darrell K., Jeff Sutherland, and Hirotaka Takeuchi. "Embracing Agile." *Harvard Business Review*, May 1, 2016. https://hbr.org/2016/05/embracing-agile.

[40] "MIMA Housing." *MIMA Housing*. Accessed May 5, 2016. http://www.mimahousing.com/.

[41] "Cheshire Architects." Accessed May 7, 2016. http://cheshirearchitects.com/.

real life. 'The Block or similar shows are agile - sequential scrums where they do a room, all trades etc, get feedback then do the next one…'

Many homeowners who project manage their own builds, work this way without realising it – making decisions all along the way about changing design, materials, finish, and so on. However, the agile approach does not work well with traditional design and build processes.

There is an opportunity to develop agile design and construction delivery workflows beyond traditional design build processes. Developing fast-track construction that overlaps beyond the shortening construction time to include feedback loops that can positively impact design. A New Zealand process that is iterative, incremental method of managing the design and build activities.

The way MOA operate is the beginning of this process. They have combined and taken control of the design and construction phases allowing for a more agile process. It could also be linked back to spatial analytics taking the learning from a projects during and post construction to impact future design and build more formally than currently.

7. Agile planning

Agile planning is where a town is seen as a service and is flexible and innovative. This may include people participating in planning. Nick Williamson explains "Green fields developments are generally cheaper than infield/brown field ones. So the Council needs to make it more expensive to do rural subdivisions than urban ones. This way of working optimises septic tank use--rather than everyone providing their own. If the developer does it, they can provide one tank for a cluster of houses, rather than one each. Similarly, if the developer has to create the driveway, the Council can optimise frontage and landscape issues."

Several of the people we spoke with talked about the need for integrated data and that the lack of APIs at the local location based level causes bottlenecks. In NZ to mash together the datasets needed and held by so many different parties.
We identified a number of Local Authority projects which are thinking differently.

- *Dublin City Beta*[42] is a project where citizens work with the council to innovate and fastrack prototypes (because they may not be permanent). Pop-up Parks are in a similar category. Granby Park in Dublin[43] was a citizen-led initiative bringing builders, architects and others together to reclaim some vacant space.
- Lambeth Council[44] in the UK and Civic Systems Lab formed an experimental "Open Works" team to co-create a network of 20 practical projects with 1000 local residents. These projects were inspired by ideas from across the world that offered the potential to support a new and more sustainable way to live our everyday lives. These 20 projects created new and engaging opportunities for sharing knowledge, spaces, and equipment; for families to work and play together; for bulk cooking, food growing and tree planting; for trading, making and repairing and for suppers, workshops, incubators and festivals.
- In Northland, New Zealand,Nick Williamson explained that the Council is less restrictive—its model is that something is permitted unless specifically restricted or prohibited. Instead of regulating the houses in a subdivision, it regulates the spaces in between, such as lockdown amenity

[42] "Dublin City Council Beta Projects." *Dublin City Council Beta Projects*. Accessed May 4, 2016. https://dubcitybeta.wordpress.com/.

[43] "Granby Park." Accessed May 4, 2016. http://www.granbypark.com/.

[44] "Participatory City." Participatory City. Accessed May 7, 2016. http://www.participatorycity.org/report-the-research/.

space. The Council requires the developer to do a management plan. There is no height limit, and no height-to-boundary controls. In terms of services, the subdivider has to put in water and septic tanks.

- Almere Port[45] an area in the Netherlands, where the local council has installed all infrastructure for a 'self-build' development. Each home comes with an A4-sized 'passport' which acts as a building permit. This specifies the main restrictions: usually just the height, any gaps required between homes, and the line of the front and the back of the properties. But beyond this owners are free to do pretty much what they want. There is one particular zone – called *I Build Free* where hardly any restrictions apply. Most commentators have been impressed by the architectural diversity of the homes and the innovation that has been displayed.
- London City 'catapult' [46] is a government funded programme designed to accelerate innovation in Urban Design and Planning. As part of this they are creating working prototypes for encouraging innovation and testing them live.
- The World Habitat Awards[47] highlight a number of similar innovations - particularly planning for low income and social housing.
- Te Karaka[48] in New Zealand is trying out a new approach to developing a community and economic development plan, using Google's Design Sprint Methodology.
- Flux Metro[49] was a project spun out of the GoogleLab innovation process. It has since been closed, but it was asking "How might we apply data-driven design principles to help the world meet the urban demand for affordable and sustainable housing?" It used Austin as a model for integrated urban and architectural design and data, but discovered their approach was not scalable to multiple cities.

"The complexity of gathering data, including the inconsistencies and errors in the datasets, ambiguity of zoning codes (sometimes by design), and the many intricacies involved with working with cities, made achieving our vision of quality and thoroughness cost prohibitive."

[45] Collinson, Patrick. "Self-Build: It's Time to Go Dutch." *The Guardian*, November 25, 2011. http://www.theguardian.com/money/2011/nov/25/self-build-go-dutch.

[46] "Future Cities Catapult." *Future Cities Catapult*. Accessed May 4, 2016. http://futurecities.catapult.org.uk/. and "Jobs with FUTURE CITIES CATAPULT." *Guardian Jobs*. Accessed May 4, 2016. https://jobs.theguardian.com/employer/4701944/future-cities-catapult/. and "Service Designer and Researcher Job with FUTURE CITIES CATAPULT." *Guardian Jobs*. Accessed May 4, 2016. https://jobs.theguardian.com/job/6271250/service-designer-and-researcher/.

[47] "World Habitat Awards." *BSHF*. Accessed May 4, 2016. https://www.bshf.org/world-habitat-awards/.

[48] Williamson, Nick. "First Impressions of Te Karaka-as-a-Service: 'Um, Right, Okay, Cool. Have You Been There Yet?.'" *Medium*, December 11, 2015. https://medium.com/a-place-as-a-service/first-impressions-of-te-karaka-as-a-service-823f49b5827e#.m7ppv1mxr. and Williamson, Nick. "Re-Imagining a Town-as-a-Service: The Community of Te Karaka on the East Coast of New Zealand's North Island Is Starting the next Chapter of Their Remarkable Journey., Mapping out the User Journey, Why Write a Plan When You Can Hold an Event!, Let's Do This!, Documenting Our Journey." *Medium*, November 30, 2015. https://medium.com/a-place-as-a-service/re-imagining-a-town-as-a-service-f9e0f0bf22be#.68ybagmdk.

[49] Chim, Nick. "Flux Metro: What We Learned." *Medium*, February 12, 2016. https://medium.com/@flux/flux-metro-what-we-learned-11fc82b6de03#.x493i5up2.

Bottlenecks and barriers to innovative disruption

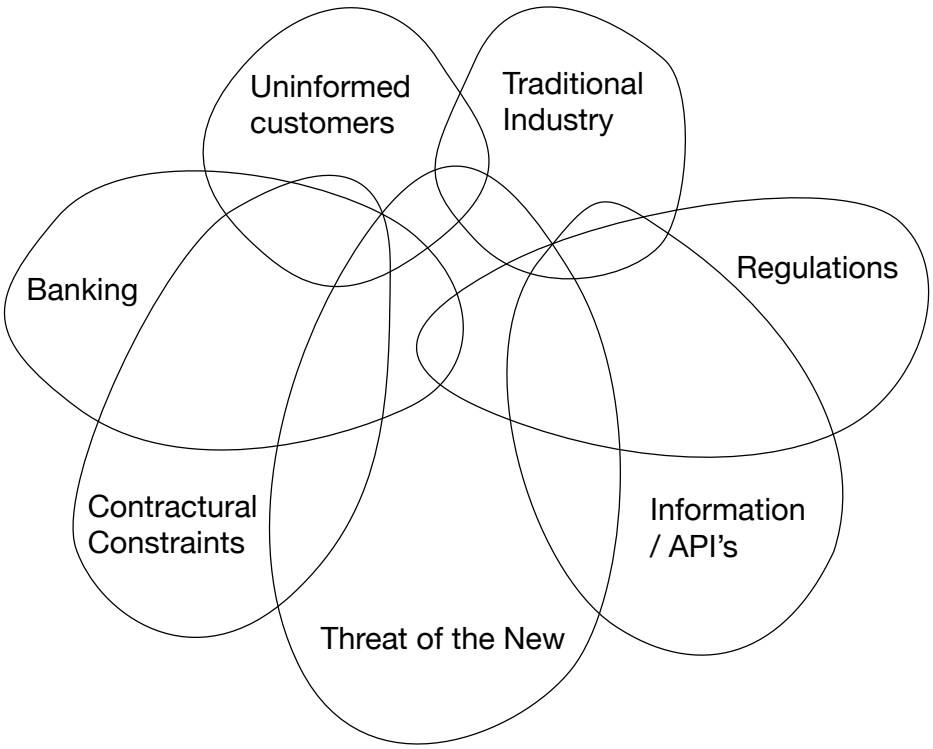
Our interviews identified the following issues as the biggest reasons why the construction industry is slow to innovate.

Mostly, the barriers have occurred as unintended consequences of regulation, and attempts to reduce risk to the industry. Ironically, the desire to remove risk has led to a slowing in improvement of quality, by reducing innovation.

We have grouped the barriers into the following categories.

- Banking
- Lack of information and data
- Uninformed customers
- Traditional industry
- Threat of the new
- Regulatory issues

Interventions need to be across all of these issues if the system of building homes is to change. They are interconnected and interdependent.



Banking

Banks rely on the current contracts for financing. They understand and require typical milestones for draw down dates, and their documents require the storage of materials onsite.

This precludes off-site builds except where the developer has sold the homeowner a fixed- price house, or house and land package. The fixed price pushes up the margin for the developer/builder and reduces risk for the bank, but does not get the homeowner the best quality house for the same money. The bank manages its risk of having the builder go broke by requiring all materials to be stored on site – which means that modern construction techniques are ruled out.

The usual milestones which banks can understand are not relevant when a house can be built in a matter of days instead of months. This incentivises people to use older building techniques and take longer to build, rather than to build a high quality factory-built house.

Lack of Information and data

Customers/homeowners in New Zealand are largely uninformed and there is no market mechanism by which they can easily understand what choices they are making when building or renovating a home. The cost of construction is a major driver, but there is no information for homeowners regarding the total cost of owning and running the home they are building.

The varying standards are confusing and there are no compulsory ratings that are applied to all homes. The cost of land in New Zealand is still too low to force the rebuild of our very poor housing stock. For example, when land values rise it makes sense to demolish the poor housing stock and replace it with quality and possibly multi-unit dwellings. New Zealanders have no place to go which helps them to determine what improvement they will get by renovating rather than building a new home.

The lack of open accessible data refers to both to central and local government land and land use data, and also to the products provided by component companies. District Plans are confusing to many people, and people need a specialist to advise them before they can understand what activities/construction they can undertake on a particular piece of land.

Uninformed customers

Customers have a view on how a house should be built ("4x2, pink batts, gib"), and this influences what and how builders make it. It is not easy for a homeowner to determine what alternatives there are, especially if what they want is a warm, dry home. Anecdotally, it appears New Zealanders expect heat pumps, heated towel rails and electric blankets to be a normal part of keeping warm - rather than expecting construction techniques which might render these obsolete.

Architects who want to make something new or better have to seek out wealthy clients who do not mind the time it takes to get through the Territorial Authority's regulatory process. They also have to seek out customers who want to manage the total cost of owning the home, not just the cost of construction.

In the United Kingdom, it is compulsory for a home to have an Energy Performance Certificate (EPC) if it is to be built, sold, or rented. Every EPC is available for the public to search and view. [50]The introduction of these has been associated with

[50] "Buying or Selling Your Home." Accessed May 4, 2016. https://www.gov.uk/buy-sell-your-home/energy-performance-certificates.

different property value increases related to the level of insulation in the houses[51]. The system allows a homeowner or occupier to understand the likely cost of running the heating in that home compared to others. It works because it is compulsory, national and standardised.

The lack of useful information for homeowners means they largely make choices for their houses based on construction cost, fashion and style rather than performance of the building. There is a role for regulation as well as education to address this. Leaving it entirely over to choice by the consumer has led to a market failure. Regulation must ensure that only high quality builds and renovations occur, the asynchronous information system means that homeowners will never have all the information they need to make the best decisions. This needs to be solved at the population level, it is not efficient to have each individual homeowner try to solve it on their own.

Traditional industry

New Zealand lacks low-cost, innovative business models; a value network that is economically coherent; and regulations and standards that facilitate change. The lack of transparency in the market means that the value network is not coherent – at the moment, the location and style of a house factor more in its value than the quality of the construction. There is no transparency for the homeowner in the choices of materials or the long term impact these will have on the quality and value of the home. The Building Act should enable change, and is designed to be performance-based. However, in reality the Codes and Standards have become a tool for managing the minimum, and making quality improvements expensive and drawn out. It is simply easier in New Zealand for those building not to innovate or improve upon the minimum.

Threat of the new

Some of new business models we need are starting to emerge. But business models that disrupt the status quo are often seen as threatening by everyone involved in the industry--by their very nature, they are different. That requires people to work and behave in different ways--and the familiar is almost always easier, simply because it is known.

Sophisticated technology is just emerging in New Zealand. The growth of CNC[52] factories, CLT[53] technology, smart software and the increase in computing power that drives BIM[54] are all good examples.

Regulatory issues

New Zealand starts with a good basis for positive disruption. We have a Building Act that encourages best processes and best use. It seeks innovation and is permissive.

However, translating those positive principles into action is a challenge. The Building

[51] "Energy Saving Measures Boost House Prices - Press Releases." Accessed May 4, 2016. https://www.gov.uk/government/news/energy-saving-measures-boost-house-prices.

[52] Computer Numerical Control (CNC) Machining is a process used in the manufacturing sector that involves the use of computers to control machine tools. Tools that can be controlled in this manner include lathes, mills, routers and grinders.

[53] Cross laminated timber (CLT) is like jumbo sized plywood except that it uses timber boards rather than peeled veneers for the glued layers. CLT panels span and support loads, and connect together to provide a very strong and stable building system. A CLT structure eliminates conventional stick framing since the panels do all the work of joists, studs and rafters. CLT is manufactured in a range of thicknesses to suit floors, internal and external walls and roofs. It may be utilised as individual components or as a complete structural system encompassing all of these. "WHAT IS CROSS LAMINATED TIMBER (CLT)?" Accessed May 4, 2016. http://www.xlam.co.nz/What%20is%20CLT.

[54] "Building Information Modeling (BIM) is one of the most promising developments in the architecture, engineering, and construction (AEC) industries. With BIM technology, one or more accurate virtual models of a building are constructed digitally. They support design through its phases, allowing better analysis and control than manual processes. When completed, these computer- generated models contain precise geometry and data needed to support the construction, fabrication, and procurement activities through which the building is realized." Eastman, Chuck. BIM Handbook. 2nd. ed. Wiley, 2011.

Code outlines the minimum requirement through the Acceptable solutions. The Verification Methods are cumbersome and expensive. The Building Code including the verification methods too often hinder innovation and quality buildings. And if the principles of the Act are not truly translated into the Building Code and compliance documents, they are not put into practice. The following aspects of the Building Act are directly relevant to this project.

- Household units have an important role in the lives of the people who use them, so are accorded a special focus. This includes recognising the special traditional and cultural aspects of the building's use.
- Maintenance requirements of household units need to be reasonable, and owners of household units need to be aware of the maintenance requirements of them.
- Buildings need to be durable, and whole of life costs of a building need to be considered.
- Standards are important in achieving compliance with the Building Code for building design and construction. Harmful effects on human health resulting from the use of building methods, products, design or building work need to be prevented or minimised.
- Innovation in methods of building design and construction is important.
- People with disabilities need to be able to enter and carry out normal activities and processes in a building.
- Buildings need to be efficient and sustainable. This includes energy use, encouraging renewable sources of energy, using materials that are efficient and sustainable, conserving water, and reducing waste during construction.

The Building Code and Standards have become the norm because the desire to reduce risk means that to build something better requires additional approval, meaning higher costs and long delays. The public perceives the Building Code to be how one SHOULD build a house, not that one can't build a house WORSE than this. This is reinforced by the banks and the Territorial Authorities

This issue is not New Zealand-specific. Australia is grappling with similar issues[55].

In Conclusion

Clayton Christiansen states that there are four conditions required for disruptive innovation to occur.
These are:

1. Sophisticated **technology** that simplifies.
2. Low-cost, **innovative business models**
3. A **value network** that is economically coherent
4. **Regulations and standards** that facilitate change.

In our discussions with New Zealand innovators we found that these conditions are not yet fully formed in this country.

The availability of some sophisticated **technology** is still nascent. Makers of Architecture, XLAM, ProductSpec and Mike Greer homes are pushing the boundaries of what is economically and technically feasible with the technology available. Increasing internet speeds, availability of APIs and better software tools will render the technological challenges less important in the coming years.
A major impediment to disruption has been the computing power required for good modelling. Cloud based systems are making the technology way more accessible.
Innovation is business models is coming, albeit slowly and in small pockets.

[55] Bachmann, Sarah. "When Codes and Standards Are Out of Sync." *Sourceable*, April 6, 2016. https://sourceable.net/codes-standards-sync/.

Innovative business models are coming, albeit slowly and in small pockets. BRANZ has an important role as a catalyst, encouraging others in the construction sector to think differently. Innovation will come, whether or not the industry is ready for it. With strategy, research, agility, and appropriate business models, New Zealand can meet the challenges of disruptive innovation with confidence. Further work is needed in order to understand how we normalise and embed business models that may seem radical or threatening to the construction industry.

The Value Network is worthy of additional research. Currently the banking and finance sector are impediments to innovation. The price of land in NZ also means that single family dwellings are prioritised over multi-tenanted spaces. This will change as pressure on land increases with population growth. Currently the banking and finance sector are impediments to innovation. So is the price of land in New Zealand, which means that single family dwellings are prioritised over multi-tenanted spaces. This may change as pressure on land increases with population growth. More research is possibly needed in this area. Homeowners/ Customers are currently unable to access useful information regarding the choices they are making between a low cost construction method versus the total cost of ownership. The Value Network also needs additional research into how to make it more economically coherent.

With regards to the regulations and standards, New Zealand's regulatory framework is permissive and performance based. The implementation of the Building Code and Approved Solutions have left us with the minimum acting as the maximum, and disincentives to improving performance. Similarly Planning rules have meant a lack of innovation, while the development of the enabling legislation had intended the opposite. Regulation must ensure that only high quality builds and renovations occur, the asynchronous information system means that homeowners will never have all the information they need to make the best decisions. This needs to be solved at the population level, it is not efficient to have each individual homeowner try to solve it on their own.

Actions suggested from our research

Actions to help consumers and homeowners

- Education about the costs and materials of homebuilding, including lifetime cost of ownership as well as the cost to construct. Building trust around new construction techniques and materials
- A website along the lines of sorted.org for homeowners. This would explain the implications of choices in the construction and renovation process; costs of ownership including heating, maintenance; and the environmental impact of materials
- Compulsory unified rating systems for houses (as opposed to varying voluntary ones now), energy, volatile organic compounds (VOCs) and other criteria
- Conversation about the size of homes and typology of homes (such as single family dwellings, apartments, sitting on suburban development).
- Understanding that the Building Code represents the minimum, not the optimum for health, comfort etc.

Actions in finance sector

- Work with key banks and leaders in the off-site/prefab construction movement to prototype new forms of less risky financing for this kind of build. This mechanism would favour quality builds over the current fixed price 'standard' builds. The new mechanism would also address standard contracts and milestoning

Action in architecture and design

- Workshop agile systems
- Develop some conventions and shared language
- Possibility to collaborate with the NZ Timber Industry on new construction techniques and materials
- Look for opportunities to prototype and demonstrate new methods of planning and building, and use in order to foster social change.

Actions in specifying

- Develop APIs - ie interfaces between the various databases and digital systems used across the sector (local and central government, private sector).
- Research into new materials
- Work with a number of TAs to improve consenting and inspection regimes for quality builds (focused on off site build/Prefab/CNC buildings), with the aim of getting a national approach
- Long-term review and redesign of the District Planning Process, Building Code and associated standards, along with other regulatory regimes which influence housing location, density and choices. This would be done with a view to raising the minimum standard of New Zealand builds and retrofits, as well as enabling newer building methodologies such as agile building. It would also enable better land use
- Open up data and make APIs available at Central Government and TA level for land and land use data (including slope, soil type, district plan rules, covenants)
- Agile Planning – exploring new ways of enabling the best use of land. Workshops with TAs, Iwi and others to look at different planning methodologies

Actions in building

- Education into new techniques, methods, materials and business models. This needs to be taught to the existing workforce, not just to incoming workers
- Role of the sector in educating the consumer/homeowner – give the industry the tools to refer people
- Workshopping lean and agile techniques for construction

Actions at the Regulatory Level

- Review the Approved Solutions with a view to raising the standards
- A complete redevelopment of building code structure and access, starting from first principles that allow a higher level of construction as the default
- Reflect modern construction tools (including software) in the Codes
- Make Planning and Building rules easily available in digital form in order to speed up application and consenting process

Appendix 1: Who we talked with

Mike Greer	Mike Greer Homes
Andrew Searle	Concision
Geoff Hunt	Hawkins
Andrew Booth*	SolarCity
Nick Williamson	Spatial Fusion
David Kernohan	Independent
Pam Bell	PreFabNZ
Jae Warrander	Makers of Architecture
Nat Cheshire	Cheshire Architects
Kay Saville-Smith	Cresa
Gary Caulfeld	Xlam
Ruth Berry	MBIE
Ruth Berry	BRANZ
Jon Thompson	ProductSpec
Mike Cole	Archaus
Pip Bowron	Wellington City Council

Appendix 2: Questions asked

1. Disruption seems to be slow coming to this industry, why do you think that is?
2. Your business goal/mission (eg building better homes)
3. How would you describe your current business model? (What do you sell and how is payment received? [interesting reading that Finnish study - Value created? also comment that over time goods become services under the value model. This kind of related to the changes in concepts of ownership that have been referred to]
    - Services Contract – payment of hours worked/invoiced
    - Services -Set price contract with milestones
    - "Product" sale (set price for land/house, set price for kit)
    - Product plus services
    - Leased product (equipment or software or fittings, or even developer building to lease rather than sell on)
    - "rent to own" product
4. Who do you see as your customer(s)?
    - Homeowners
    - Architects
    - Builders
    - Government
    - ?
5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?
6. Do you sell through any agents? Channels? Specifiers etc. ?
7. What are your primary costs?
8. What are the biggest bottlenecks/costs/delay points for your company?
9. What are you doing differently from your competitors or others in the industry?
10. Who do you see at the most disruptive members of the industry?
11. Why?
12. If a competitor did something really scary that threatened your business, what would it be?
13. Would you consider doing that?
14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?
15. What changes are you planning to the way your business works in the next few years?

Appendix 3: Responses

Interviewed

Jon Thompson
Chad Graybeal
Chris Welch

Company

Product Spec
productspec.net
SmartSpec
smartspec.co.nz

Interviewed by

Antony Pelosi

Interviewed on

2/26/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

Jon has always thought that the industry is the last to innovate
Every project is a prototype,
Large range of stakeholders
Construction industry has lack of uptake of tech
Traditional edu
People always ask for the same
Lack of api's in New Zealand
No standard for information
TA's all different
It is not clear who is the benefactor is, BIM for example
The industry is risk adverse

2. Your business goal/mission (eg building better homes)

Faster easier access to relevant construction information
Construction information that is accessible and central provided with a universal standard

3. How would you describe your current business model? What do you sell and how is payment received?

Subscription based
Monthly and annual
Manufacturer/importer disruptor pay for Product Spec and Smart Spec and Architects/Designs pay for SmartSpec
Events the connect to services
Additional service that support Productspec and SmartSpec

4. Who do you see as your customer(s)?

Manufacturer/importer disruptor and Architects/designers
Have been looking at builders

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Manufacturer/importer disruptors (300-400 in NZ Productspec has 200 as customers)
via change offer with Sales people and events, also api to access information adding value
Architects/Designers (4000 total)
events, workshops, key speakers that provide CPD points
spike in new users after events

6. Do you sell through any agents? Channels? Specifiers etc.?

No. Both types of customers attract more customers

7. What are your primary costs?

Staff
Development costs

8. What are the biggest bottlenecks/costs/delay points for your company?

Resource time for product turn around
Lack of good data and good api's
Regional difference

9. What are you doing differently from your competitors or others in the industry?

We are leading with innovations, other just follow
Industry aware and technology aware, others only industry aware

10. Who do you see at the most disruptive members of the industry?

WeWork
Flux
NBBJ
Makers of Architecture hacking tools and process
CLT
disruption will be around fabrication

11. Why??

Fabrication as it has been least effected still moving from manual process to CNC

12. If a competitor did something really scary that threatened your business, what would it be?

a global product/service offering at scale like uber to taxi

13. Would you consider doing that?

Yes, through BIM
Limited size of market in New Zealand

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

Yes, do things faster. The concept and business model has been right, Using data that was not there and timing of services to soon sometimes

15. What changes are you planning to the way your business works in the next few years?

Address bottleneck
Love the idea of more R&D
How to take things Global

Interviewed

Nick Williamson

Company

Spatial Fusion
www.spatialfusion.co.nz

Interviewed by

Antony Pelosi
Melissa Clark-Reynolds

Interviewed on

3/6/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

I think its because of the general level of service changing - eg how to get 24 hour building consent turnaround. Bank can turnaround highly regulated stuff within 24 hours. Customers have come to expect it form other industries, and then Councils - 10 days for a LIM etc. More millennials are coming in and are questioning stuff. Dealing with local government politics, consenting etc very risk averse and slow. 78 councils have very different sizes and experience. Bigger council worse they are. Provincial more willing to try things. Do less volume too. Optimal size of local industry (eg inspectors, practitioners, their relationship, professional planners, consultants etc). Skill gap to do innovation is not clear. Harder where the relationships are not strong. May need expediter model...

Lack of open data, buried in stupid pdf reports when the data is there. Hard for people to navigate the data that is there.

Desire to keep rates down means less staff means less knowledge and complicated regulatory processes rather than engaging with people. Need designers influence within public service.

2. Your business goal/mission (eg building better homes)

Breaking stuff. I am going around to reframe some of that. Eg Working with Council in Far North to be most innovative - process for 24 hour consents by changing the workflow. What is the MVP for a

consent - issue a decision with reasons, all the report writing etc is for the auditor etc, not for the actual customer who wants to build. Could strip out all the stuff that tales 20 days, and strip down to a MVP process. Sprint meeting and checklist...all know within first 20 minutes for most builds. Then conditions, and reasons. Go pro it, and send them the file. DONE. email to client. Transparent. The legal requirements are pretty minimal.... in writing. Used Google ventures 5 day sprint to review the district plan. Done it. de-risked it.

3. How would you describe your current business model? What do you sell and how is payment received?

Consultancy with a fee. Local and Central Government (MSD, MBIE), grant funding (local government) that local communities/ community group get (eg Regional Economic Grants)

4. Who do you see as your customer(s)?

The innovation sector/ecosystem. Want to inspire others to break stuff too. Take away excuse for not doing. Main followers are others in the industry including lots from overseas.

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Through word of mouth, people I know in various circles, service design, planning, hackers, civic technology movement, place making urban movement. Re imagining democracy. Speaking events, journal papers, conferences, using social media to spread the word. Been working in industry 20 years so work those networks. Find the central government innovators (eg DIA), local government much easier to network with. Can do microprojects in the council at operational level. Then compile them..... Problem? Agile, service design, getting speed. Reducing the work, making it less lumpy Using software tools to automate more. Using digital tools to speed up democracy

6. Do you sell through any agents? Channels? Specifiers etc.?

Collaborators

7. What are your primary costs?

Travel, so can do face to face stuff, going to events (they give me registration) but I want to be in the space. Tech, opendata, local government, trying to link up groups that don't usually overlap.

8. What are the biggest bottlenecks/costs/delay points for your company?

Biggest delays are usually getting hierarchy to agree, procurement processes, wont be a budget or have a budget for something else, and have a contestable process - so have to go to market to choose me anyway because no one else can do it. Often decision makers don't know what we are on about - eg bringing Augmented Reality with conservation with forestry.

Executive level.

9. What are you doing differently from your competitors or others in the industry?

Local democracy. Applying agile and sofware techniques to planning.

The Block or similar shows are agile - sequential scrums where they do a room all trades ect, get feedback then do the next one... Instead of regulating the houses in a subdivision, regulate the spaces in between - eg lock down amenity space. Implemented in Whangarei. Require the developer to do a management plan, and make it permitted use. No height limit, no height to boundary controls.

Services planning? Subdivider has to put in water and septic tanks. Green fields generally cheaper than infield/brown field. So need to make it more expensive to do rural subdivision than urban (eg bush/ riparian planting, installation of services). Optimises the septic tank use - rather than everyone doing it. Fire service requires a fire supply. If developer does it then an do one tank for a cluster f houses, rather than one each. Developer had to do driveway, that optimised frontage issues and landscape issues, etc.

10. Who do you see at the most disruptive members of the industry?

Dublin City Council beta is cool. One dude at DCC, placemaker urban designer person. They allocate 10% to innovation. He has done crowdsourcing civic projects (pop up stuff). If cheap and reversible, can get done. Urban prototyping https://dubcitybeta.wordpress.com/

Amelia Loye Engage2 Sydney, community engagement using digital town hall stuff http://engage2.com.au/team/amelia-loye-director/ Just picked up a project for Au PM & Cabinet using digital tools.

Future Cities Catapult out of London see video and JD - https://jobs.theguardian.com/job/6271250/service-designer-and-researcher/#success Using it build urban innovation ecosystem

Detroit, Philly, Chicago

Codesign studio, Collingwood, Victoria, Melbourne, do lots of pop up stuff. Come in as a subbie for rapid urban revitalisation http://codesignstudio.com.au/rapid-urban-revitalisation/ http://codesignstudio.com.au/ Collaborative citymaking

11. Why??

They have changed the decision making process, same as what I did, mostly have to unlearn what you have learnt - eg Lions club used to just build a playground if needed one, and that has been lost. All of a sudden minor projects have become major. Now we have learned behavior, asking permission. Now we have an over reliance on avoiding risk. These guys find the loopholes in the rules. Sometimes that means the rules get looked at and got rid of. Listening to the community and getting them it. Never ask approval.

12. If a competitor did something really scary that threatened your business, what would it be?

Not really a competitor who would. Next thing, underpinning principle - education. How do you grow innovators? Using data driven data to serve local democracy. What does it look like for the digital natives? How will hyperlocal communities work when out 12 and unders are voting.... and in 25 years when these kids are really running. Hyperlocal, hyper personalised... where

13. Would you consider doing that?

Maker movements, problem solving, more risk exposure for kids

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

I have always been a bit of a troublemaker. Needs the twenty years of heritage of what government is.... over time it always gets centralised, devolved, centralised, devolved.... need to have gone through a few cycles. isn't broken. Do a bit of Robin Hood stuff. Work for the big boys, and know system so can force disruption on them - eg submitting a YouTube video as evidence. Got to a point when I couldn't stand my profession any longer, and had to disrupt it. Could take career risking stands, so decided could mess shit up. Adjust the rate based on the big guys paying more and funding the stuff that cant be funded.

15. What changes are you planning to the way your business works in the next few years?

I need to try to transfer as much of my technical knowledge as I can to collaborators with fringe skills sets to me. I have unique set of skills in terms of local government speak, need to open the doors - to procurement for the eco system. Mainstream to disrupters, because they are not on council preferred provider list. I don't have capacity to do the projects, want to frame the disruption into a VP for the councils and find them people who can do it. define their needs, eg service designer, digital, agile coach and help them to get ti. Then all my collaborator colleagues get work and mainstream it. Then open doors, and thinking about the next one, want to be a mentor not project. Can they be replicated? What sectors can we take on next? Need to build a bigger team form UX, service design, etc who understand communities.

Innovation is at operational level, not industry level in local government. Want to work at reinventing local government. If you wanted to reinvent local government fully digital today, how would we do it? Why not use Kaipara as a prototype for co-creating with a pissed off community?

Nobody knows the answer, so have to trust the process. I would love to see politicians, residents ect all get together in a small community.

What happens post capitalism? That will be a disruption there. That will alter everything I do.

Interviewed

Gary Caulfield

Company

Xlam
xlam.co.nz

Interviewed by

Antony Pelosi

Interviewed on

3/9/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

We are very old traditional industry, thinking, training, material, boom and bust. Too busy in boom and can not afford in a bust. The edu new ideas tech from academia will drive change

2. Your business goal/mission (eg building better homes)

Provide efficient affordable solutions

3. How would you describe your current business model? What do you sell and how is payment received?

Material manufacturer and supplier. Element and design. A product that is paid for once delivered. Depends on scale may be some small upfront costs

4. Who do you see as your customer(s)?

All sectors, direct with owners, builders.

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Badly to date, CLT has gain a lot of press last 3 years. The company now moving into structured company, reactive market moving to proactive

The benefits of CLT bespoke solutions driven product, can be shaped in may ways, it is very simple and based on traditional sustainable and accurate.
Off site more certainty programme and certainty on cost.
The process allows problems to be solved early and entry cost is the same as exit cost

6. Do you sell through any agents? Channels? Specifiers etc.?

No

7. What are your primary costs?

Timber and glue 50%
Then capital cost of machines and plant
labour

8. What are the biggest bottlenecks/costs/delay points for your company?

Design delays with projects (a project related business waiting on next project)

9. What are you doing differently from your competitors or others in the industry?

Only ones doing CLT in NZ AUS

10. Who do you see at the most disruptive members of the industry?

The culture is driven by the lost cost, centre around cheapest cost, all parties
Samson corp (http://www.samson.co.nz/) Marco Creemers developer family life-time cost
Jason Happy Kiwi income property trust Life-time cost

11. Why??

Understand the benefits of considering the life time cost of building

12. If a competitor did something really scary that threatened your business, what would it be?

The only company in NZ, the size of market is a constraint. Another competitor would be a good thing, help grow the market

13. Would you consider doing that?

n/a

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

No because it is still a new product that needs to grow and be proven

15. What changes are you planning to the way your business works in the next few years?

Open new factories, AUS company are investing, New CEO moving to be proactive. Moving factories closing to supply to timber

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Interviewed

Pam Bell

Company

PrefabNZ
Prefabnz.com

Interviewed by

Antony Pelosi
Melissa Clark-Reynolds

Interviewed on

3/10/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

Buckminster Fuller said - Construction industry has 50 year time lag between the idea and its realisation. Said that in 60s or 70s so we are there...

Focus of PrefabNZ is how to move from prenail to panels being traditional so can have watertight, weathertight place in a few days. Matter of when, not if, we move to more panel construction. We will be there when PlaceMakers are selling panels alongside prenail. The Concison plant is so important – it shows what can be done when a joint venture collaboration is at scale, great air-time for panelised technology. Panel technology in Japan and Germany is much more common – 15-20% of all houses. Sweden is even further ahead using panelised technology for all new-build housing – detached and multi-unit.

The culture change is the main barrier to new technology uptake. Ask an older builder what happened when prenail came in. Essentially the space we are in now. We are working with how to make something that seems radical / threatening to become normalised. Until Joe Blow builder accepts it, it won't change. Disrputive technology that isn't seen as normal / de-risked / traditional, won't get used, so won't be a successful disruptor

2. Your business goal/mission (eg building better homes)

Mission statement is to increase prefab uptake to 40% of buildings by cost. This looks like more panelised uptake. Creating more watertight homes by creating a weatherproof shell in a few days, so they are watertight, and don't have to rely on inventions like plastic blocks under the wall framing that allow water to run away. Initial founding goal was to link specifiers with the suppliers, using collaboration.

Government not going to fix it, industry has to be the change.

3. How would you describe your current business model? What do you sell and how is payment received?

Only just survive, industry association model, just tiny turnover made up of 1/3 membership levies, 1/3 partnership sponsorship, 1/3 one-off grants, research etc. That last third fluctuates so is really scary. PrefabNZ has had great support from BRANZ over the years. Both BRANZ & MBIE were really helpful with project-specific grants. BRANZ gave massive amounts of guidance through a board member on PrefabNZ. We also rely on a strong Board. Innovation in the construction industry drives us more than prefabrication specifically.

4. Who do you see as your customer(s)?

Public, Industry, Government

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Delivering value to the members is our core to day-to-day operations – Inform (the public), educate (the members), advocate (with local / central government). Visibility for members' work and key projects through website, info via events, web, alliances, conferences etc, advocacy through to government regulations – wider industry. Done a lot in marketing events space. Own events - conference, regional events, site visits etc, cluster events with other organisations, go to other people's events and present in NZ and overseas.

6. Do you sell through any agents? Channels? Specifiers etc.?

Sponsorship Partnerships, Industry Association Partnership - MoU with (formal and informal) – NZ Institute of Architects (international research identifies architects as the block to prebuilt innovation uptake), work with user groups eg. retirement homes (RVA), Community Housing Aotearoa (CHA lead is Scott Figenshow – they are doing interesting things around tax, and Social Housing Bonds - backed by Auckland City – they have no confirmed lifecycle of government funding). PrefabNZ did a pipeline report of retirement and community housing – it is hard to visualise housing development / supply without the funding. MoU relationships with PrefabAus, and Modular Building Institute in US. Shared a lot with Australia. Other member orgs offshore include BDF in Germany.

Grand Designs is a good vehicle – helps to spread the word and empower consumers with knowledge.

German consumers are very knowledgeable and insist on sustainable options. Need to have NZ consumers do that. And rethink size of our homes

7. What are your primary costs?

Staff

8. What are the biggest bottlenecks/costs/delay points for your company?

Part of what we do is try to encourage PrefabNZ members to measure, because we need more evidence in the construction industry. Refer Sourceable article on 'Is this a Business' by David Chandler (spoke at PrefabNZ CoLab – and will run joint MasterClass with PrefabNZ in August) – https://sourceable.net/is-this-a-business-if-so-whats-the-story/#

Prefabrication is on cusp of business and architecture/construction, that's what makes it interesting. Condenses the whole supply chain. Architect, Manufacturer, developer as one entity. NZ costs are said to be 30% more than Australia (Productivity Commission report). Condense the process / value chain and aggregate savings. In Germany - in plant have architects, manufacture, and deliver and assemble. Mike Greer Homes / Spanbild (Concision JV) seems to be doing that. Halved their build time.

Industry in general doesn't have any good data on costs, time savings, remedial, lifetime costs – need Quantity Surveyors on board. There are many innovation blockages - have to unblock every step of supply chain, Quantity Surveyors are currently not looking at time involved and costing time-savings, remedial savings, H&S savings etc. Even CoCA building, where roof was constructed on ground (Arrow Intnl) with 1/3 cost savings, ½ time savings, 7/8 time at height savings – all the savings were not measured or transparent.

9. What are you doing differently from your competitors or others in the industry?

PrefabNZ Members are challenging the status quo, going up against the larger traditional suppliers such as Fletchers and Carters which is challenging. Trying to deliver something that stacks up differently. One example of delivering value, is that a high-end bespoke staged project can have subsequent stages delivered in prebuilt chunks so there is less disruption (noise, dust, transport) while people live in the completed first stage. The number one advantage of prebuilt construction is improved quality, not cost savings, also less time on site (saving time is the fastest way to save money), savings in sustainability - 90% of waste saved, 60% of time on site saved.

Our traditional industry struggles with the cultural changes needed to adopt innovative construction.

PrefabNZ membership goes across the supply chain, not just one piece. So manufacturers and designers, we are platform for collaboration. Ultimately all the prebuilt technology should all be open source, accessible, prosaic, understandable, de-risked, just like prenail. If we look back to mid last century, Govt research got us precast concrete and prenail. Railway houses were prefab'd - prenailing, pre-cutting in the Waikato for 900 houses, pre State Housing. State Housing had a 10 year panelised scheme also.

10. Who do you see at the most disruptive members of the industry?

Stonewood were interesting. They helped set up modular bathroom company - Construction Components ltd. Sapone is the bathroom brand. Andrew Crossland is the contact. Concision is a JV between Mike Greer Homes and Spanbild, $10m of German panelised machinery in the factory. Seem to be transparent, testing everything. Collaborative etc – all the hallmarks of a good business. Suggest you also talk with Chris Moller, one of our PrefabNZ Board members who is a big and deep thinker. He has designed an innovative engineered timber gluelam community centre in Chch. Stunning. Stanley Group

been innovators for at least 15 years. Kevin Stanley is on Board of BRANZ. Going ahead and figuring things out project by project – a bespoke approach. Take on impossible projects and deliver them using innovative methods. eg Elam Hall / Uni Akld student housing, Knoll Ridge café on Mt Ruapehu, tricky constrained sites, massive pre-planning Keith Hay Homes - third generation Hay now (grandson Matthew Hay on PrefabNZ Board). Set up in period when government backed speculative house building in the 60s. Enduring – which is successful. Experimented with collaborative - affordable architecture with Andre Hodgskin of Architex. There are real opportunities to do great design at affordable end of market. Enduring well priced, beautiful buildings. Uncomfortable collaborations.

Arrow Intnl is also in the prefab space. Developing a modular division within Arrow which is exciting.

A big opportunity / challenge is the procurement / govt departments - Ministry of Education were going to rethink the transportable temporary class room. It was a terrible procurement process. Govt procurement in general is very difficult and our Members have stories of spending huge amounts of money on processes that don't go anywhere. There needs to be more engagement from Govt departments across to building / procurement experts within MBIE. Similarly, Housing NZ's RightStart programme is another lost opportunity. It could have been more innovative through use of panelised and modular.

At a local Government level, WCC had great intentions with Arlington apartments, with a brief for innovative prefab modular design – but it has ended up as a modular plan and use of traditional precast which is a bit disappointing.

Hobsonville land company doing an innovation showcase soon, so there is hope there.

Suggest check in with Chris Kane at MBIE is their Innovation guy.

11. Why??

See above.

12. If a competitor did something really scary that threatened your business, what would it be?

In the UK there is a body called Buildoffsite UK, when we started in 2010 we were open to being Buildoffsite NZ. But the Steering Group / Board decided to start PrefabNZ from the ground-up.

There were plans for Buildoffsite UK to create Buildoffsite Australasia. That was threatening because the industry is so small in NZ. Don't need so many organisations – there is even the argument that PrefabNZ should be part of a bigger entity not our own organisations – part of the builders or architects…

13. Would you consider doing that?

Yes, but there are cultural barriers - NZIA historically had trouble accepting change, including prefabrication. That is changing somewhat. We believe architects should be more accessible, approachable, affordable. There is an outdated image of architects with the black turtleneck and black rimmed glasses - prefab is in essence architecture for the people.

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

I might understand more about government, mechanisms of policy. MBIE has felt at times like an impenetrable fortress, UK has government mandate of 15% modern methods of construction for social housing. We don't have that kind of mandate. If PrefabNZ had more say, we would make businesses more committed to innovation. We also wonder if membership organisation is the right mechanism to encourage uptake of innovation. In a perverse way, the earthquakes meant more opportunities. They sped up the development of the HIVE Home Innovation Village as a showcase medium for example.

There is a future role to teach builders that building code is minimum, not a benchmark. Eg insulation standards and more flexibility. Need to train builders differently. Opportunity with building code. In Netherlands 30msq before consent - in NZ 10 msq. So could do infill, 1 br studios etc. Auckland could do a by-law about it. Make it removable and resalable on a market like TradeMe.

15. What changes are you planning to the way your business works in the next few years?

Going to have a closer relationship with development community, banks around finance issues, explore and understand government relationships better, test their commitment to innovation. Need more exemplars of great innovative built projects.

We aren't living sustainably yet. Need some leadership of the way to build and live. Market doesn't have enough housing size / type choice. Martin Udale Auckland developer look at his LinkedIN and new business Tall Wood with PrefabNZ Board Chair Daiman Otto.

We don't have transparency of reputation in NZ - eg of Builders. Germany is more reputation-based – if you muck up on one job you don't ever get another. Japanese show housing villages are really great - show people glazing etc. Proof is in experiencing the difference and explaining the value proposition clearly. In NZ we only talk about the upfront costs. Also, Japanese understand that women drive the house-purchase decisions. The German factories have kids space so they can be taken care of while clients can concentrate on their purchasing decisions

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Interviewed

Geoff Hunt

Company

Hawkins
www.hawkins.co.nz

Interviewed by

Antony Pelosi

Interviewed on

3/15/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

Locked up in Contracts, Locked in old ways of doing things. Housing NZ old thinking, focus on a few buildings frustration, need to start thinking about neighborhoods/communities

2. Your business goal/mission (eg building better homes)

Building better communities
at all levels: within and outside the company and beyond

3. How would you describe your current business model? What do you sell and how is payment received?

Construction Company doing projects
Monthly payments/ Joint Venture

4. Who do you see as your customer(s)?

Universities (Auckland and Canterbury)
Auckland Airport
City councils
Due to longterm ownership benefits

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Family owned business, Jobs gained via winning tenures, by selling the capable team. Hawkins are expert in complex projects by being open and collaborative. The future of the industry is collaborative
Some customers are experts and understand benefits of total live-cycle costs.

6. Do you sell through any agents? Channels? Specifiers etc.?

No

7. What are your primary costs?

People (taking on full risk of projects)

8. What are the biggest bottlenecks/costs/delay points for your company?

When Design is late
Owner trying to squeeze cost
Everyone doing the min.

9. What are you doing differently from your competitors or others in the industry?

BIM Hawkins has been using BIM for construction and scheduling
Still needing to sell benefits/ Clash
Consideration of waste material
Lean project methods
IT infrastructure (mobile) including for defects (better for all)
Early contract involvement with design

10. Who do you see at the most disruptive members of the industry?

Ebert focused on dairy industry
http://www.mansons.co.nz/ as developer-building owner
Leighs construction moving to Auckland

11. Why??

n/a

12. If a competitor did something really scary that threatened your business, what would it be?

Something took cost out of construction (added value)

13. Would you consider doing that?

Yes

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

Smaller may be better
Design and build having control building the best buildings

15. What changes are you planning to the way your business works in the next few years?

Incrementally remove cost
Work more collaboratively with sub contractors

Interviewed

Nat Cheshire

Company

Cheshire Architects
cheshirearchitects.com

Interviewed by

Antony Pelosi

Interviewed on

3/16/2016

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1. Disruption seems to be slow coming to this industry, why do you think that is?

Defined by Conflict different levels.
Less empowered most disruptive. It is hard to make something [buildings]
Requires a single approach
Developments now different form 20 years ago, speed of change

2. Your business goal/mission (eg building better homes)

Always evolving
Tearing at preconception
Shift into doing not just architecture
Moving to become the client

3. How would you describe your current business model? What do you sell and how is payment received?

Services based model
Shifting to development

4. Who do you see as your customer(s)?

Everyone

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Don't market
Do enter awards
Do exceptional work

6. Do you sell through any agents? Channels? Specifiers etc.?

n/a

7. What are your primary costs?

People (looking after the collective, empowering staff)

8. What are the biggest bottlenecks/costs/delay points for your company?

Strategic leadership (time)

9. What are you doing differently from your competitors or others in the industry?

Trans-disciplinary design over a larger breath with intensity and rigor (holistic thinking) approach to the commercial urban space, faster fluid, inventing the triangle model (not sure what this is)

10. Who do you see at the most disruptive members of the industry?

Box living http://www.boxliving.co.nz/
Most like will not come form architects

11. Why??

n/a

12. If a competitor did something really scary that threatened your business, what would it be?

Start before us, to start something

13. Would you consider doing that?

Yes

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

Yes, would do things differently working (learning) from failures building in critical refection

15. What changes are you planning to the way your business works in the next few years?

Move towards becoming a developer/ the client
Moving offshore, expanding into other countries
The unknown

Interviewed

Kay Saville-Smith

Company

Cresa
www.cresa.co.nz

Interviewed by

Antony Pelosi

Interviewed on

3/31/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

Highly casualised workforce (why).
The industry is very good at putting deals together. People get win fall gains due to boom bust industry, everyone trying to squeeze at the good times
New Zealanders ignorant about how houses work (constructed, perform)
Companies (builders) develop with products
There is a lost of quality QS resulting in over estimates
Buildings locked into reward schemes
Buildings based on look or fashion rather than quality, industry good at following fashion trends, difference between values/ likes not good at quality
Many conflicts of interest
No one taking responsibility

2. Your business goal/mission (eg building better homes)

To change ways of thinking

3. How would you describe your current business model? What do you sell and how is payment received?

n/a

4. Who do you see as your customer(s)?

Anyone who is interested in/or impacts on public good, everyone

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Contestable funds
This question is important to the industry, what is the true value, industry have to deliver real value.
Design led construction, open up the industry
How to reward the good stuff

6. Do you sell through any agents? Channels? Specifiers etc.?

n/a

7. What are your primary costs?

Staff, travel for communication

8. What are the biggest bottlenecks/costs/delay points for your company?

In relation to the industry:
Inability to make decisions, need t act as a team
Need to design the process

9. What are you doing differently from your competitors or others in the industry?

n/a

10. Who do you see at the most disruptive members of the industry?

Jeremy Salmond http://salmondreed.co.nz/
Anne Salmond (anthropologist, environmentalist and writer)
Liz toomey (law)
Anne Depuis (urban sociology, sociology of housing, urban intensification)

11. Why??

n/a

12. If a competitor did something really scary that threatened your business, what would it be?

The way in which splits between private and charitable procurement is problematic

13. Would you consider doing that?

n/a

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

7 houses with $1.6m
Engaging the council at all levels, how they commit
Maintain strategic partnerships, but paying on-time building trust.
Taking learnings from each building to adjust next

15. What changes are you planning to the way your business works in the next few years?

Need a positive intersection for building and housing markets
Constructive criticism that is transforming rather than destructive
What is the value the industry provide

Interviewed

Beth Cameron
Jae Warrander

Company

Makers of Architecture
makersofarchitecture.co.nz
Makers Fabrication
makersfabrication.co.nz

Interviewed by

Antony Pelosi
Melissa Clark-Reynolds

Interviewed on

3/17/2016

1. Disruption seems to be slow coming to this industry, why do you think that is?

Lack of interdisciplinary projects, teams in Architecture training. Frustrating. A lot of resistance, Architecture is a slow moving beast, not much feedback. Old architect running practice and young people follow their way of doing it. Stuff learnt in school gets forgotten because you do it as they do it in the firm, doesn't let you deviate. The guys at top (problem they are guys) , making money, all of trades around how buildings are made, and their openness to information, being able to navigate that information without freaking out, the translation of that info hard, we can do 2D and 3D, but anything different, the subtrades are resistant unless they are open. They like to be their own experts and not be told to do it differently. We have clients who see what we do, but industry in general councils, sub trades need to the info in traditional ways. Hard to know how to make it happen and get through. Come up against wall at every step. We want data, so want subtrades to use timesheets – they won't do it.

Education
Resistance to technology
We want everything measured so we know how long things take, but builders aren't tech savvy. Could you find one in NZ? We are not even close to what we want. Builders who come through Architecture school are making the shift.
Council, Wellington is trying harder than most. Queenstown have done a jump – online submissions, visualise the transactions, open sourced. Real risk for submitting to the council (doesn't protect IP for people) but much more transparent.
General risk and liability, so we have less to lose as new architects, unknowing helps us try stuff out.

Client can be hard, advantage if they are own client. Being own client – ie as developer would be great. Could take different risk and display capabilities by doing for yourself. Intended to be quick process, but can be difficult based on ability for client to make decisions, and get finance.

2. Your business goal/mission (eg building better homes)

Making it efficient, engaging with technological design efficiencies. Facilitating Architectural building that allows wide demographic to build resilient buildings. Too slim at the moment. Our builders are too efficient. Builders go up so fast, we can't keep up. Eg getting information out for fabrication. We are bottleneck at moment.

Your business model
2 companies
Design service - MOA
Margins _ Makers of Fabrication MF

Want to push towards a more product based cohesive solution. Customisable type of building that can be flexible. Something in between mass and highly customized. Nothing really there. Want to do a concept design and have an automated system, only change the things you want . General template for the system, and then efficient build and extraction, Parametric allows flexibility. Technology coming through. Mass Customisation. The tech is on brink of being there. Making it (see SHOP architects NY), want to test and experiment.

Wanted MF to be a fablab for architects, so could use new tech, and the expense is so high. Chris Moller using it, and some façade prototyping for Athfields, Firstlight own project. Damien Otto in Auckland, keen on CNC work. We haven't yet worked out how to price it etc. Maybe time, maybe percentages of products? Been doing a lot of furniture production for furniture design companies, that has taught us a lot for prototyping, we produce their furniture to sell . Lots of design tree stuff. Opened our eyes to tools in machine and how to custom make the tools. Still learning the tolerances.

Consistency of product is so much better when the new methods are used. Eg CNC. Interesting in Australia, using the skills, people and technologies from the automotive industry and using that in construction. Worth looking at.

3. How would you describe your current business model? What do you sell and how is payment received?

n/a

4. Who do you see as your customer(s)?

MF – Architect, tender on jobs as builders, Furniture Design, more prefab in future – ie Architect submit a design and we will price it as a prefab.

MOA – homeowner

5. How do you market (ie how do you get customers?) and what is your Value Proposition (what will your customer have when you have finished? Or what problem of theirs do you solve?)?

Magazine, and Internet, book publications. Spoken at conferences, eg Colab, University talks, Engineering groups (another interdisciplinary gap, Engineers freaked out by tech, trust their own calculations and not the computer. They usually "look at at glass, not the table" but we know it is a system. Real issue, tested system preferred to new designs. Word of mouth, Opendesk (Wikihouse people, furniture from UK and open sources the files, open sources for CNC for personal use, hoping to be a maker for them, democratized design.) & Minimod (Uruguay, Brazil collab MAPA and XX? They are making 30-20 sqm box living, baches, their design is really beautiful, using CLT)

6. Do you sell through any agents? Channels? Specifiers etc.?

no

7. What are your primary costs?

MF
Space hiring, paying off the machine, staff , material (engineered wood products seem so expensive when wee price of logs vs plywood) We want to use locally sourced materials. Traditional building is 60-80% labour. Ours is 20% labour, but spend a lot more on higher quality product, so final cost is same. Get more bang for that,. CLT is expensive, but makes life easy. Subtrades all the same or more expensive,. Still learning so higher costs than want.

MOA
Time (if could, would be wages!), tech subscriptions are high. Eg $11k a seat for some kit. Insurances are high. Pay for 10 years per project. Computers.

8. What are the biggest bottlenecks/costs/delay points for your company?

Design is the bottleneck, we can build fast now. Documentation for consent, Documentation of design. Repeating ourselves every time. WHY? Huge amazing tools we have now. Building consent process. Bank financing is a massive limitation. Banks don't lend on prefab as much. Banks want a fixed price etc. Banks loan on staged payments. Completion of stages, and materials on site. Efficient building means walls same day as foundations, so not staged. Need to be our own bank. Fixed price too much risk for us., Uncertainty of most stuff we deal with. Cookie cutter homes are easier to fund. Banks set up for that. Asking for particular contracts. All set up for one model of building. Bottleneck is inspector coming to check – which stops prefab from happening, because have to go to their timeframe. Now moving liability to builder to certify, allow builder to send photos rather than the inspector coming over. Education of the homeowner is a big roadblock. Ned to produce some guides for homeowners. JG Gardeners etc just handle all that for them. Home owner needs more help. Standard building companies can't answer most questions, but homeowners don't know what to ask.

9. What are you doing differently from your competitors or others in the industry?

Everything, we are very non conventional, trying to write our own script, while increasing the standards and making this tech available. Different approach, responsible for manufacturing of these home/ products. Changes liabilities, so we are at higher risk, but also fully understand what we are doing. See diagram on their website. Actively trying to generate change in the industry. Massive, awesome, feel privileged to be in that position to be in control of what we are doing and where we are directed. Huge amount of learning, challenging business models, don't want to fit into traditional model or standard. Offering something new.
Customisation, from Arch pov not form building perspective. Make design primary in prefab rather than the building trade. Space should be quality,

10. Who do you see at the most disruptive members of the industry?

Prefab NZ
Frasers Engineering (doing CNC making fire engines) They have bought up little companies, lots of designers and not many in the workshop since the machines work so well. Trying to move into Arch realm, made facades for Britomart
Cheshire – using different technologies, trans disciplinary architecture
Timberlab & Xlam, allow us to embrace that new technology
Shop
IKEA
Muji (have very different building codes)

11. Why??

n/a

12. If a competitor did something really scary that threatened your business, what would it be?

Would be scale. We would get eaten alive if someone came in at scale. It is hard though. Huge investment required. Have to scale up at some point, but need tech really working. We would think globally once we have the whole system working better.

13. Would you consider doing that?

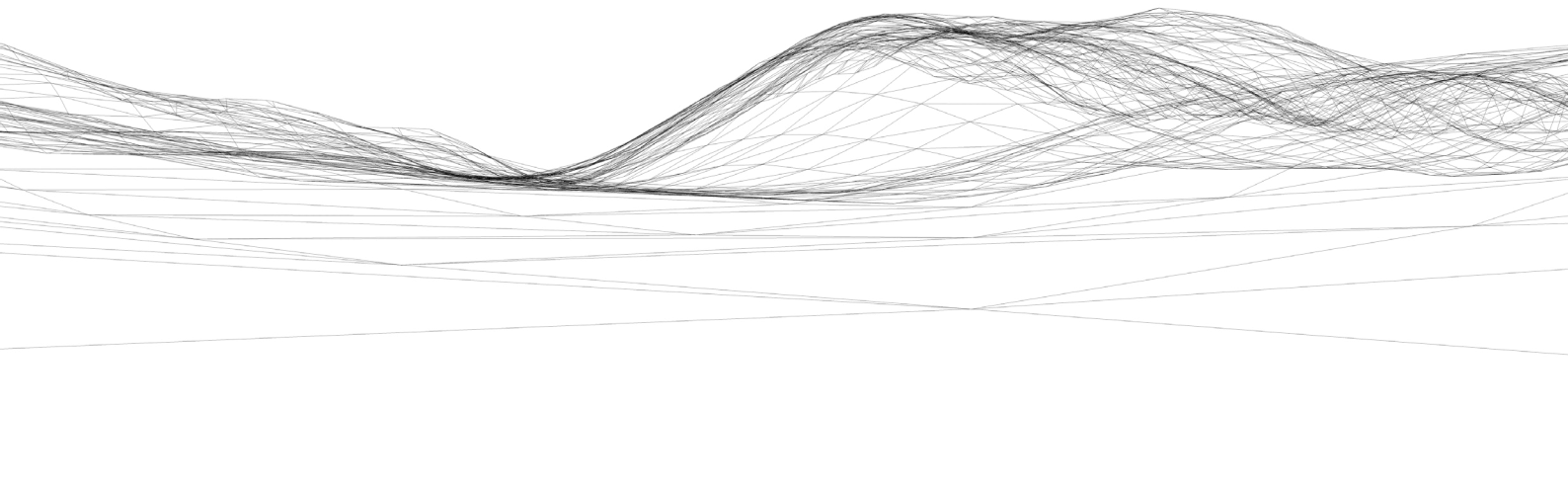
Yes

14. If you were starting your business today (or a similar one in the industry) would you do any of it any differently? How? Why?

Would be scale. We would get eaten alive if someone came in at scale. It is hard though. Huge investment required. Have to scale up at some point, but need tech really working. We would think globally once we have the whole system working better

15. What changes are you planning to the way your business works in the next few years?

Tuning and go to scale, would be great to get into shop fit outs and bigger scale – eg medium residential. Having opportunity through our own or special clients to push the tech that much further, eg geometries of the output. Might be installations. Hard to get through building code. Housing is most restrictive... Do lots of R & D – be at the forefront. Get a community to grow around us. We want to see a whole shift.



Longevity of stock.
How do we build the base so renovation is easier

Pros & cons

Consumer facing decision making advice

Ownership vs Rental

Investment value of property

Shifting the Paradigm on the lifecycle costs → But there is an opportunity

Flexibility → How do we build in flexibility rather than market segments

→ Humans in the process to interpret information

Functionality & use

The Grown

-The living Future world

→ 3D printing feels like the known - grown is the next frontier.

Interesting emergent technology

Why can't we do our own thing - build our own model bas on new conditions & values.

"I know the least about this

REGULATORS SIT HERE TOO

other ways to build

Technology as a tool — It can cloud how we look at the world

EGO DRIVEN BUILDING

↓

CONSUMER -DRIVEN TOO

WE NEED THEM TO BUILD SMALLER HOMES

TV's SELL HOMES, PEOPLE WILL SPEND MO TIME THINKING ABOU THEIR TV...

Values

Town planning

Values drive the equitability of the outcome.

"We want everyone else to..."

TO NEW ZEALAND?

Rules for best disruption

What would make a "sweet spot" for the industry?

Capital investment

WHAT IS SET IN STONE? WHAT IS SET IN CHALK?

Flip

What connects our values & regulations

Regulation to Support innovation

How can it be a foil to fight against?

How can it unlock & enable?

Provides rules to abide by

Nihle Flexibility

CO-WORKING FACILITIES

H&S adding 25K to the price of a house

Undermining long term business?

Tension

FUTURE → VALUES → TEST WITH REGULATIONS

Liability

ARE RT UPS?

CORPORATES ADORE REGULATION?

WHERE IS THE SWEET SPOT?

Moving beyond dollar value

What positive impact can our companies have on the environment?

People voting for local govt are supportive of the status quo → Democratic Deficiency

WHO Are the Disruptors?

eg. a threats

disruptors off shore → disruption will happen here

Builders & designers in offshore

Govt — Is govt leadership disrupted?

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Behind the Seen